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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,639	11/15/2001	Masayuki Mishima	Q67304	7410

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EXAMINER
YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
1774	

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-4

Office Action Summary	Application No.	Applicant(s)	
	09/987,639	MISHIMA ET AL.	
	Examiner	Art Unit	
	Marie R. Yamnitzky	1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/15/01 and 04/24/02* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3, 4, 8-13, 15, 16 and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Baldo et al. in *Applied Physics Letters*, Vol. 75, No. 1, pp. 4-6 (July 5, 1999) or Baldo et al. (6,097,147).

In *Applied Physics Letters*, Baldo et al. disclose a light-emitting device comprising, in the order listed, a substrate, an anode, a hole-transporting layer, a light-emitting layer, a layer consisting of BCP and a cathode. For example, see Fig. 1 and the paragraph bridging pages 4 and 5. The light-emitting layer comprises a hole-transporting material and a phosphorescent compound. The phosphorescent compound is an orthometallated iridium complex, thus meeting the limitations of the phosphorescent compound as further defined by present claims 10, 11, 22 and 23. The phosphorescent compound is present in the light-emitting layer in an amount within the range set forth in present claims 12 and 24.

The '147 patent to Baldo et al. discloses a light-emitting device comprising, in the order listed, a substrate, an anode, a hole-transporting layer, a light-emitting layer, a layer consisting of BCP and a cathode. For example, see Fig. 3 and column 6, lines 5-38. The light-emitting layer

comprises a hole-transporting material and a phosphorescent compound. The phosphorescent compound is a porphyrin metal complex, thus meeting the limitations of the phosphorescent compound as further defined by present claims 10, 11, 22 and 23. (While present claims 11 and 23 limit the metal of the orthometallated metal complex, these claims do not limit the phosphorescent compound to an orthometallated metal complex.) The phosphorescent compound is present in the light-emitting layer in an amount within the range set forth in present claims 12 and 24.

The layer of BCP in the devices disclosed in either Baldo reference meets the limitations of the electron-transporting layer as required by present claims 1 and 13 and further limited by claims 3, 4, 15 and 16. Although each Baldo reference refers to the BCP layer as an exciton blocking layer, the BCP layer also inherently transports electrons. Based on the energy level structure shown in Fig. 1 of the Baldo article, BCP has an ionization potential greater than 5.9 eV as required by present independent claims 1 and 13 (HOMO level $\simeq$ ionization potential). With respect to claims 3 and 15, it is the examiner's position that it is reasonable to expect that BCP meets the electron mobility limitation of these claims. With respect to claims 4 and 16, BCP is an aromatic heterocyclic compound comprising nitrogen as a hetero atom.

3. Claims 2 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Baldo et al. in *Applied Physics Letters*, Vol. 75, No. 1, pp. 4-6 (July 5, 1999) or Baldo et al. (6,097,147), as applied to claims 1, 3, 4, 8-13, 15, 16 and 20-24 above and as evidenced by Lamansky et al. (US 2002/0182441 A1).

BCP is expected by the examiner to have a minimum excitation triplet energy level in the range of 60 to 90 kcal/mol as required by claims 2 and 14 given the disclosure of Lamansky et al. that BCP has a triplet energy of 2.5 eV and Alq_3 has a triplet energy of 2.0 eV (see Table 1 on page 23). Using the triplet energy in kcal/mol of Alq_3 as disclosed on page 50 of the present specification and presuming the relationship between the triplet energy in eV is equal to the relationship between the triplet energy in kcal/mol, the examiner calculates the triplet energy in kcal/mol for BCP to be 72.5 (2.5 eV / 2.0 eV = x kcal/mol / 58 kcal/mol where x kcal/mol is the triplet energy of BCP).

4. Claims 1-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Okada et al. (US 6,461,747 B1).

The applied reference has a common inventor with the instant application, but a different inventive entity. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

See the whole patent, especially Examples 5 and 7 (columns 77-79). The light-emitting devices of Examples 5 and 7 comprise, in the order listed, a substrate, an anode, a hole-transporting layer, a light-emitting layer, an electron-transporting layer and a cathode.

The light-emitting layer comprises a hole-transporting material and a phosphorescent compound. The phosphorescent compound is an orthometallated iridium complex, thus meeting the limitations of the phosphorescent compound as further defined by present claims 10, 11, 22 and 23. The phosphorescent compound is present in the light-emitting layer in an amount within the range set forth in present claims 12 and 24.

The electron-transporting layer consists of compound 21. The formula for compound 21 is shown in column 28 of the patent. Compound 21 is the same as compound (27) of the present application and therefore meets the ionization potential, triplet energy level and electron mobility limitations set forth in present claims 1-3 and 13-15 (see pages 30 and 50 of the present specification). Compound 21 also meets the limitations of the electron-transporting material as further defined by present claims 4-7 and 16-19.

5. Claims 1-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Igarashi et al. (US 2002/0024293 A1) or Ise et al. (US 2002/0028329 A1).

Each of the applied references has a common inventor with the instant application, but a different inventive entity. Based upon the earlier effective U.S. filing date of each reference, each constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the references was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

In Igarashi's published application, see the light-emitting devices of Comparative Examples 1 and 2 and Examples 1-5.

In Ise's published application, see the light emitting devices of Examples 1-10 and Comparative Example 1.

The exemplary devices of the references comprise, in the order listed, a substrate, an anode, a hole-transporting layer, a light-emitting layer, an electron-transporting layer and a cathode.

The light-emitting layer comprises a hole-transporting material and a phosphorescent compound. The phosphorescent compound is an orthometallated iridium complex, thus meeting the limitations of the phosphorescent compound as further defined by present claims 10, 11, 22 and 23. The phosphorescent compound is present in the light-emitting layer in an amount within the range set forth in present claims 12 and 24.

The electron-transporting layer of Igarashi's Comparative Examples 1-2 and Examples 1-2 consists of compound E which is the same as compound (24) of the present application and therefore meets the ionization potential, triplet energy level and electron mobility limitations set forth in present claims 1-3 and 13-15, and meets the limitations of the electron-transporting

material as further defined by present claims 4-7 and 16-19. (The examiner notes that the formula for compound E in Igarashi's published application contains an apparent error in showing one of the three diazole ring structures as a 1,2-diazole instead of a 1,3-diazole.)

The electron-transporting layer of Ise's Examples 1-8 and Comparative Example 1 consists of compound B-40. Ise's compound B-40 is the same as compound (27) of the present application and therefore meets the ionization potential, triplet energy level and electron mobility limitations set forth in present claims 1-3 and 13-15. Ise's compound B-40 also meets the limitations of the electron-transporting material as further defined by present claims 4-7 and 16-19.

The electron-transporting layer of Igarashi's Examples 3-5 consists of compound G and the electron-transporting layer of Ise's Examples 9 and 10 consists of compound A-19. Compound G and compound A-19 are the same compound. This compound meets the triplet energy level limitation of present claim 2 (see Table 1 of Ise's published application) and meets the limitations recited in present claims 4-6 and 16-18. It is the examiner's position that it is reasonable to expect that this compound also meets the ionization potential and electron mobility limitations of present claims 1, 3, 13 and 15 given the similarity of compound G/ compound A-19 to the specific electron-transporting compounds disclosed in the present specification.

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-24 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 10-22 of copending Application No. 09/905,946. Although the conflicting claims are not identical, they are not patentably distinct from each other because there is substantial overlap between the light-emitting devices claimed in the present claims and the light-emitting devices claimed in the copending claims. Based on the copending claims, especially copending claim 10, one of ordinary skill in the art would be motivated to select compounds inherently meeting the limitations of the electron-transporting material required by the present claims. Copending claim 10 requires an azole compound represented by a general formula (A). General formula (A) represents a compound having a condensed azole skeleton, and encompasses condensed imidazopyridines.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. Spelling and grammatical corrections are needed in the claims as follows:

In line 5 of each of claims 1 and 13, "comprises" should read --comprise--.

In claims 5, 6, 17 and 18, each occurrence of "skelton" should read --skeleton--.

In the last line of each of claims 7 and 19, "an" should read --a--.

9. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Adachi et al. (US 2002/0113545 A1) disclose the same device layer structure as disclosed in the Baldo article applied above and refer to the BCP layer as an electron-transporting layer.

10. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax numbers for Art Unit 1774 are (703) 872-9311 for official after final faxes and (703) 872-9310 or (703) 305-5408 for all other official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (703) 872-9041.)

MRY
July 28, 2003

Marie R. Yamnitzky

MARIE YAMNITZKY
PRIMARY EXAMINER

1774